

# Safety Bulletin

DMC SAFETY OFFICE

(DSN: 633-7841)

## SUN SAFETY

### Why Guard Against Unprotected Exposure to Sunlight?

Sunshine is both friend and foe. The sun provides warmth and light, improves mental health, kills germs, and is essential for growth and development of most living things. Unfortunately, excessive sun exposure can cause blistering sunburns, premature aging (wrinkles and blotches), cataracts, a weakened immune system, and skin cancer. (A cataract is a loss of transparency in the lens of the eye that clouds vision and may cause blindness.) With over one million new cases each year, skin cancer is now considered epidemic. This year there will be more new cases of skin cancer than the total of new cancers of the prostate, breast, lung, and colon combined!

Sunlight is believed to cause 90 percent of non-melanoma skin cancer. The number of skin cancer cases has dramatically risen, especially in the last three to four decades, from these and other factors:

- Modern clothing exposes more skin.
- Tanning the skin is falsely viewed as healthy.
- Decreasing amounts of stratospheric ozone which partially protects the earth's surface from receiving cancer producing ultraviolet (UV) radiation, principally from the sun.
- Many people have moved to sunnier states.
- General aging of the population.

During April 2000, the U.S. Department of Health and Human Services--for the first time--listed solar radiation as a "known human carcinogen" via the Ninth Report on Carcinogens. Thus the Department effectively stated that UV rays had officially joined the ranks of known cancer-causing elements like arsenic, asbestos, radon, and tobacco smoke. Building on this declaration, the Office of Safety and Health Administration--during July 2000 - released formal sun safety protection guidelines for outdoor workers. These safeguard measures, now updated, are summarized in a pocket card entitled, "Protecting Yourself in the Sun" which can be downloaded at <http://www.osha.gov/Publications/osh3166.pdf>.

### Skin Cancer Types

There are actually over 200 types of cancer that can invade skin tissue. The three major forms of cancer that originate in the skin are basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and the deadliest form - malignant melanoma.

Skin cancer can develop anywhere on the body but most often appears on surfaces receiving the greatest amount of sunshine. BCC and SCC often take the form of a pale, wax-like, pearly bump or a red, scaly, sharply outlined patch. The patches may crust, discharge pus, and sometimes bleed.

If not treated early, SCC may spread to other parts of the body. Less than one percent of people with SCC or BCC will die from skin cancer. For many people, these two skin cancers can cause some disfigurement based on the amount of damaged skin the physician must remove. Fortunately, skin cancer can be easily cured, in most cases, if the disease is treated in its early stages.

Malignant melanoma is the most serious form of skin cancer. It often arises from or near a mole. It often appears on parts of the body which receive little direct sunlight. There are various warning signs that should prompt individuals to visit their physician, especially a dermatologist. Examine moles or growths for:

- Asymmetry: an imaginary line drawn through the mole produces two halves that do not match.
- Border: the border of the mole has an irregular shape or notched (jagged) edges.
- Color: the color is not uniform but has a mixture or "bleeding" of colors such as black, brown, red, and blue, etc
- Diameter: the distance across is larger than a standard pencil eraser.

Melanoma rates have increased three to four percent each year since at least the early eighties.

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## More Hazards From too Much Sunlight

Since sun exposure is understood to be the major cause of skin cancer, it is extremely important to protect children and youth from over-exposure to sunlight. This caution is reinforced by the fact that up to 50 percent of an individual's lifetime contact with sunshine occurs before adulthood - at least for children who, as adults, acquire indoor occupations. A teacher's or parent's efforts to help children adopt sun-safe behaviors are much preferred to treating skin cancer later in life.

The sun's role in skin cancer results from its emission of invisible UV rays, which include UVA and UVB. These two sectors of UV radiation enter the skin cells causing both visible and invisible injuries. During the middle of the day, outdoor areas can be likened to a radiation chamber.

Sunburn is an example of visible injury. Childhood sunburns likely increase the risk that children will get melanoma in adulthood. Less well known is that tanning is actually an outward sign of internal damage as the skin desperately tries to protect itself. Unfortunately, a tan offers an inadequate defense against future solar assault.

Ozone, a naturally occurring "sunscreen" in the stratosphere above us, partially filters out harmful UVB. Unfortunately, the ozone layer is thinning from the release of chlorofluorocarbons (CFCs) into the air, along with other factors. CFCs are used in refrigerants, insulating foams, and solvents, etc. To slow down ozone layer destruction, many countries have signed treaties such as the Montreal Protocol on Substances that Deplete the Ozone Layer, which phases out the use of CFCs and other like substances.

## High Risk Conditions for UV Exposure

UV rays linked to skin cancer development are more intense (destructive) under certain timeframes or conditions, usually related to the sun's angle to the earth and/or the depth of atmosphere through which the sun's rays must pass:

- From 10 a.m. to 4 p.m.
- From mid-spring through mid-fall.
- At geographical latitudes nearer the equator (like Australia).
- At higher altitudes.
- Absent thick cloud cover.
- With highly reflective surfaces such as snow and water.

Individuals should also understand that tanning parlors, sun lamps, and sun beds emit UV radiation that is often more damaging than natural sunlight. Remember there is no safe tan resulting from UV exposure!

The UV Index predicts the concentration of UV rays bombarding a given geographical area. Since early Autumn 2000, there is a new, free service on the Internet that allows individuals to enter their zip code and obtain their neighborhood's predicted UV Index for the day. Go to [www.epa.gov/epahome/commsearch.htm](http://www.epa.gov/epahome/commsearch.htm), input your zip code, click on the "UV Index," and then click on "Submit." The UV index will be displayed along with an interpretive chart.

## Personal High Risk Factors for Skin Cancer

Skin cancer can afflict any person regardless of skin color. Individuals are more likely to get skin cancer if they have one or more of these characteristics:

- Fair skin
- Blue, green, or hazel eyes
- Light-colored hair
- Freckles
- Tendency to burn rather than tan
- History of severe sunburns

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- Have many moles (especially 50 or more)
- Personal or family history of skin cancer
- Outdoor occupation

Many medications also increase a person's sensitivity to light and therefore the risk for skin cancer. Some common types of such medications include tranquilizers, diuretics, anti-inflammatories, antibiotics, and hypertension pills to name a few. Read the medicine label or ask your pharmacist or doctor regarding your drug intake.

## How to Protect People from Getting Skin Cancer

Here are the basic strategies to shield children and adults from excessive sun exposure:

- Reduce sun exposure from 10 a.m. to 4 p.m., when UV rays are strongest. This is especially important from mid-spring through mid-fall.
  - Wear a wide-brimmed hat with at least a four-inch brim that produces a shadow that covers the face and neck. A bandana covering the neck can also help.
  - Wear tightly woven, loose-fitting clothing that covers as much of the body as possible.
  - When feasible, stay under shade (trees, physical structures), especially from 10 a.m. to 4 p.m.
  - Wear sunglasses that include a warranty stating they provide 100 percent UVA and UVB (broad-spectrum) protection.
  - Liberally apply sunscreen to exposed skin 15 minutes before venturing outdoors. The sunscreen container should specify a sun protection factor (SPF) rating of 30 or above and should state that it provides broad-spectrum (UVA and UVB) protection. Lotion- or cream-based sunscreens tend to adhere to the skin longer, thus providing better protection.
  - PABA-free sunscreens are recommended for persons with sensitive skin. Susceptible individuals may also want to avoid oxybenzone and dioxybenzone (check the label). To test if a given sunscreen will cause an allergic reaction, apply it on a small patch of skin on the underside of the forearm and monitor the skin's response for 24 hours. To reduce development of wrinkles and skin aging, look for sunscreens that contain either zinc oxide (z-cote), or Parsol 1789 (avobenzone). The July 2007 issue of Consumer Reports rates a number of sunscreen products.
  - Depending on outdoor conditions, sunscreen should be re-applied at least every two hours.
- Warning: Don't depend on sunscreens alone to protect children and adults from skin cancer. Instead, rely as much as possible on a combination of the guidelines here listed.
- Please note that the SPF number on the sunscreen tube indicates how many times longer, under ideal conditions, a person can stay out in the sun without beginning to turn red in comparison with the amount of time totally unprotected skin would start to burn. Research indicates these numbers are sometimes overstated.
  - Avoid tanning salons, beds, and sunlamps.

## Self Skin Examination

Whether or not an individual practices the previously stated skin cancer prevention methods, it is wise to perform a self skin examination using a hand mirror at least once every one to three months and to seek an annual medical examination. The possible first signs of developing skin cancer can often be self-observed according to the characteristics described earlier regarding moles and growths. See your doctor if you suspect any problems.

## Treating Skin Cancer

Finally, the good news is that most skin cancer can be successfully treated if detected in its earlier phases. About 90 percent of skin cancers are treated with surgery. Other solutions include radiation therapy, electrodesiccation (tissue destruction by heat), cryosurgery (tissue destruction by freezing), laser treatment, and drug therapy, etc. Of course, the best "treatment," as always, is PREVENTION.

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